

On Some Fishes from Lake Biwa, with Description  
of One New Species and a List of All the Fish  
Species hitherto known from That Locality.

BY

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A collection of Lake Biwa fishes, which had been made in the interval of Sept. 1906 to Sept. 1907 by Mr. Shimazu, a naturalist in Kyoto, was presented by that gentleman to the Imperial University of Tokyo. These material, together with those which were collected by Mr. J. Nakanishi in Jan.—June, 1898, in the same locality and were since stored up in the University collection, will be noted upon in this paper. A species is apparently new to science, for which I propose the name *Acheilognathus shimazui*. At the end I append a list of all the fish species that have thus far become known from Lake Biwa.

Petromyzonidæ.

**1. *Lampetra japonica*** (Von Martens).

Local name: Yatsume unagi.

A single specimen 16 cm. long.

Obtained at Tokiwa, Jan. 1907.

Siluridæ.

**2. *Liobagrus reini*** (Hilgendorf).

Local name: Shichimyōzi.

A single specimen, 8.3 cm. long measured to caudal base.

Obtained at Iba, June 1907.

**3. *Fluvidraco ransonneti* (Steindachner).**

Local name: Gigi.

Two specimens. The largest is 10.2 cm. long measured to caudal base.

Obtained at Tokiwa and Zeze, May 1898 and Febr. 1907.

**4. *Parasilurus asotus* (Linnæus).**

Local name: Namazu.

A single specimen, 12.5 cm. long measured to caudal base.

Obtained at Tokiwa, Jan. 1907.

**Cobitidæ.**

**5. *Misgurnus anguillicaudatus* (Cantor).**

Local name: Dojō.

Two specimens; the largest is 12.5 cm. long without caudal.

Obtained at Momose, Dec. 1906.

**6. *Cobitis tænia* Linnæus.**

Local name: Shima dojō.

Sixteen specimens, the largest measuring 8.7 cm. in length without caudal.

Collected at Kihama and Momose, March 1898 and Dec. 1906.

**7. *Hymenophysa curta* (Schlegel).**

Local name: Ayu modoki; Umi dojō.

Five specimens, the largest being 9.1 cm. long without caudal.

Obtained at Kihama and Iba, Febr. 1898 and July 1907.

**Cyprinidæ.**

**8. *Paracheilognathus rhombea* (Schlegel).**

Local name: Hira bote; Kanehira.

Seventeen specimens, the largest being 9.5 cm. long measured to caudal base.

Collected at Katata and Iba, Febr. 1898 and July 1907.

**9. *Acheilognathus lanceolata* (Schlegel).**

Local name: Bote.

Numerous specimens, the largest being 8.5 cm. long measured to caudal base.

Collected at Iba, Katata, Funaki, Matsubara and Kihama, Jan.—May, 1898 and Febr. 1907.

**10. *Acheilognathus limbata* (Schlegel).**

Local name: Bote; Aburazyako.

Numerous specimens. The largest is 5.5 cm. long measured to caudal base.

Collected at Iba, Matsubara, Funaki and Kihama, Jan.—May, 1898 and Febr. 1907.

**11. *Acheilognathus cyanostigma* Jordan & Fowler.**

Local name: Aburazyako.

Seventeen specimens; the largest is 3.9 cm. long without caudal.

Collected at Matsubara in May 1898.

Lateral band and spot very distinct in many specimens; in some others the band ends rather indistinctly in the anterior part, the spot being indistinct also; in still others the entire lateral band and the spot are both indistinct.

**12. *Acheilognathus shimazui*, n. sp.**

Local name: Aburabote.

Head 4, height of body  $2\frac{3}{5}$  to  $2\frac{3}{4}$  in total length exclusive of caudal; eye  $3\frac{1}{4}$ , snout  $3\frac{1}{4}$ , interorbital  $2\frac{3}{5}$ , maxillary barbel  $3\frac{1}{4}$  in head. D. III, 8; A. II, 10; L. lat. 32 to 35; L. trans. 5 to 6+1+3.

Body moderately compressed; caudal peduncle compressed. Back elevated. Upper contour highest at the origin of dorsal, but lower contour lowest at a short distance before the origin of ventral. Eye lateral, high up; interorbital broader than diameter of eye, convex. Snout equal to eye in length, its profile rather steep; nape elevated. Maxillary barbel rather strong, equal to diameter of eye in length.

Pharyngeal teeth one-rowed, 3 to 5 in number, the teeth entire or slightly serrated. Highest part of the body at the origin of ventral; origin of dorsal midway between tip of snout and root of middle caudal rays; anal inserted beneath third or fourth soft ray of dorsal; origin of last ray of dorsal above fourth soft ray of anal; outer margin of both these fins broadly rounded. Pectoral pointed, not reaching ventral; ventral broadly rounded in posterior margin, reaching origin of anal. Caudal emarginate. Scales large; lateral line complete. Colour in formalin brownish, paler beneath; edge of every scale darker; without shoulder spot and lateral band; both vertical fins each with 2 pale longitudinal bands. Caudal and pectoral paler, without marking. Ventral dark, much so posteriorly.

The species is very closely allied to *Acheilognathus lanceolata* (Schlegel), but differs from this in having fewer scales and slightly longer barbel and in the marking.

The species was obtained at Tokiwa in Dec. 1906. The type specimen is numbered 1833 in the Zoological Museum, Imperial University of Tokyo. The species is named for Mr. Shimazu who collected the specimens.

*Measurements of Acheilognathus shimazui.*

Specimen	A.	B. (Type.)
Total length (measured to root of middle rays of caudal) ..	5.2 cm.	5.3 cm.
Height of body .. .. .	2.0 "	1.9 "
Width of body .. .. .	0.9 "	0.9 "
Height of caudal peduncle .. .. .	0.7 "	0.7 "
Length of head .. .. .	1.3 "	1.3 "
Diameter of eye .. .. .	0.4 "	0.4 "
Interorbital width .. .. .	0.5 "	0.5 "
Length of snout .. .. .	0.4 "	0.4 "

Length of barbel.. .. .	0.4 cm.	0.4 cm.
Height of the highest ray of dorsal .. .. .	0.9 „	0.9 „
Height of the highest ray of anal .. .. .	0.8 „	0.8 „
Length of pectoral .. .. .	0.9 „	1.0 „
Length of ventral .. .. .	0.8 „	0.8 „
Number of rays of dorsal.. .. .	III, 8	III, 8
Number of rays of anal .. .. .	II, 10	II, 10
L. lat. .. .. .	32 or 33	35 or 33
L. trans. .. .. .	9 (5+1+3)	10 (6+1+3)
Number of scales between lateral line and root of ventral..	4	4
Number of rays of pectoral .. .. .	13 or 14	12 or 14
Number of rays of ventral .. .. .	9	9

### 13. *Leucogobio jordani* Ishikawa.

Local name: Yanagi moroko.

One typical specimen, 7.3 cm. long measured to caudal base.

Obtained at Tokiwa, Dec. 1906.

One other specimen, 9.3 cm. long measured to caudal base was obtained at Iba in May 1907.

The specimen bears the local name "Honmoroko." It closely agrees with *Leucogobio jordani*, described and figured by Dr. Ishikawa, but differs from this in the origin of dorsal being slightly nearer to the origin of rudimentary caudal rays than to the tip of snout, and in the same being farther from the base of middle caudal rays than from the tip of snout. Nevertheless, I consider the specimen to be not sufficiently differentiated to base a distinct species upon it; so that I have referred it to *Leucogobio jordani* Ishikawa.

### 14. *Leucogobio mayedæ* Jordan & Snyder.

Local name: Deme moroko; Yanagi moroko; Moroko.

Numerous typical specimens, the largest measuring 9 cm. in length as measured to caudal base, obtained at Katata, Matsubara, Zeze, Kihama and Funaki, Jan.—May, 1898.

Mixed with the above were obtained at Zeze, Katata and Funaki (Jan.—April, 1898), numerous others which do not quite agree with the description of the species. In these, the origin of dorsal lies midway between tip of snout and origin of the uppermost ray of caudal; on the dorsal fin is present a broad dark oblique band running from a point slightly above the middle of first ray to near tip of last ray; beside the lateral band there occurs a dark spot at the base of the middle rays of caudal. Size up to 8 cm. in length without caudal. Provisionally I include the form within the range of *Leucogobio mayedæ*.

**15. *Leucogobio güntheri* Ishikawa.**

Local name: Moroko; Yanagi moroko.

Eleven specimens. The largest is 8.4 cm. long, measured without caudal.

Collected at Momose and Katata, Febr. 1898 and Nov. 1906.

**16. *Zezero hilgendorfi* (Ishikawa).**

Local name: Aburame.

One specimen, 9.8 cm. long as measured without caudal.

Obtained at Hirata, Nov. 1906.

**17. *Sarcocheilichthys variegatus* (Schlegel).**

Local name: Iigai.

Numerous specimens. The largest is 14 cm. long without caudal.

Collected at Iba, Kihama, Matsubara, Kaminifu and Nagahama, in Febr.—May 1898 and in Febr. 1907.

**18. *Zacco sieboldi* (Schlegel).**

Local name: Mutsu.

Numerous specimens. The largest is 12 cm. long without caudal.

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Collected at Iba, Funaki and Kihama, March 1898 and June 1907.

**19. *Zacco platypus* (Schlegel).**

Local name: Haya; Oikawa.

Two specimens. The largest is 10.5 cm. long without caudal.

Collected at Funaki and Tokiwa in 1898 and in Febr. 1907.

**20. *Pseudogobio esocinus* (Schlegel).**

Local name: Kamatsuka.

Six specimens. The largest is 15 cm. long without caudal.

Collected at Kihama, Matsubara and Tokiwa, in Febr.—May 1898 and in Dec. 1906.

**21. *Pseudorasbora parva* (Schlegel).**

Local name: Yoshitsutsuki; Chōchinmoroko; Ishimoroko.

Numerous specimens. The largest is 6.5 cm. long without caudal.

Obtained at Nagahama and Momose in May 1898 and in Dec. 1906.

**22. *Ischikauia steenackeri* (Sauvage).**

Local name: Wataka.

Numerous specimens. The largest is 20.5 cm. long without caudal.

Collected at Iba, Katata and Funaki, in Jan.—March 1898 and in Febr. 1907.

**23. *Leuciscus hakuensis* Günther.**

Local name: Ugui.

Three specimens. The largest is 25.5 cm. long without caudal.

Collected at Iba and Kihama, in Jan.—Febr. 1898 and in March 1907.

**24. *Leuciscus jouyi* Jordan & Snyder.**

Local name: Abura mutsu; Abura moroko.

Three specimens. The largest is 8.5 cm. long without caudal.

Obtained at Iba and Kaminifu, in Febr. 1898 and in June 1907.

**25. *Biwia zezera* (Ishikawa).**

Local name: Zezera.

Numerous specimens. The largest is 5.9 cm. long without caudal

Collected at Kihama in Febr. 1898.

Markings present in some specimens, but altogether absent in others.

**26. *Hemibarbus barbus* (Schlegel).**

Local name: Migoi.

One specimen, 14.5 cm. long without caudal.

Obtained at Kihama, Febr. 1898.

**27. *Opsariichthys uncirostris* (Schlegel).**

Local name: Hasu.

Two specimens. The largest is 18 cm. long without caudal.

Obtained at Tokiwa and Funaki, Jan. 1898 and 1907.

**28. *Carassius auratus* (Linnæus).**

Local name: Gengorō buna; Hiwara; Mabuna; Ganzo.

Numerous specimens. The largest is 12.5 cm. long without caudal.

Collected at Funaki, Wani, Tokiwa, Iba and Kihama in Jan.—April, 1898, and in Jan.—Febr., 1907.

The different local names are applied to this species according to certain variation in form and marking, but this can not be regarded to represent specific difference. The species is about as much variable as the following species.

**29. *Cyprinus carpio* Linnæus.**

Local name: Koi; Yamato goi.

Six specimens. The largest is 15.5 cm. long without caudal.

Collected at Funaki, Kihama and Tokiwa, in Febr.—June, 1898, and in Jan.—Sept., 1907.



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Salmonidæ.

**30. *Oncorhynchus masou* (Brevoort).**

Local name: Amenouwo.

Numerous specimens; the largest being 31 cm. long without caudal.  
Obtained at the Salmon Haon Hatchery, Kaminifu and Momose  
in Febr. 1898 and in March 1907.

**31. *Plecoglossus altivelis* Schlegel.**

Local name: Hiuwo; Koayu.

Twelve specimens. The largest is 8.8 cm. long without caudal.  
Collected at Hirata, Momose, Funaki and Kihama, in Jan.—Febr.,  
1898 and in Sept. 1906.

Pœciliidæ.

**32. *Oryzias latipes* (Schlegel).**

Local name: Uroni; Medaka.

Eight specimens. The largest is 2.3 cm. long without caudal.  
Obtained at Tokiwa in Febr. 1907.

**33. *Fundulichthys virescens* (Schlegel).**

Local name: Kinta.

Two specimens. The largest is 3.6 cm. long without caudal.  
Obtained at Tokiwa in Jan. 1907.

Cottidæ.

**34. *Cottus pollux* Günther.**

Local name: Fugu; Okoze; Kazika.

Three specimens. The largest is 8.5 cm. long without caudal.  
Collected at Takase, Iba and Tokiwa, between Dec. 1906 and  
June 1907.

Gobiidæ.

**35. *Ctenogobius similis* (Gill).**

Local name : Ishimochi ; Ishibishisho ; Ishibushi.

Numerous specimens. The largest is 9.2 cm. long without caudal.  
Collected at Momose, Tokiwa, Kihama and Matsubara in May 1898 and in Oct. 1906—Febr. 1907.

**36. *Chænogobius castaneus* (O'Shaughnessy).**

Local name : Isaza.

Numerous specimens. The largest is 5 cm. long without caudal.  
Collected at Momose and Funaki, May 1898 and Oct. 1906.  
D. VI—8 or 11 to 12. A. 9 or 11 to 12.

**37. *Chænogobius macrognathos* (Bleeker).**

Local name : Haze ; Ishibushi.

Two specimens. The largest is 9.1 cm. long without caudal.  
Collected at Matsubara and Iba, in May 1898 and in Febr. 1907.

**38. *Odontobutis obscurus* (Schlegel).**

Local name : Donko ; Ishibushi ; Doman.

Three specimens. The largest is 9 cm. long without caudal.  
Collected at Kihama and Momose, in March—May 1898 and in Dec. 1906.

**A List of All the Fish Species hitherto known  
from Lake Biwa.**

*[Species printed in smaller type are somewhat doubtful to the locality.]*

Petromyzonidæ.

**1. *Lampetra japonica* (Von Martens).**

Local name : Yatsume unagi.

Siluridæ.

**2. *Liobagrus reini* Hilgendorf.**

Local name : Shichimyōzi ; Hinamazu.

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3. **Fluvidraco ransonneti** (Steindachner).

Local name: Gigi; Gibachi.

4. **Fluvidraco nudiceps** (Sauvage).

5. **Parasilurus asotus** (Linnæus).

Local name: Namazu.

6. **Pseudobagrus aurantiacus** (Schlegel).

Local name: Gigi.

Cobitidæ.

7. **Cobitis tænia** Linnæus.

Local name: Shimadojō.

8. **Misgurnus anguillicaudatus** (Cantor).

Local name: Dojō.

9. **Hymenophysa curta** (Schlegel).

Local name: Ayumodoki; Umidojō.

Cyprinidæ.

10. **Paracheilognathus rhombea** (Schlegel).

Local name: Hirabote; Kanehira.

11. **Paracheilognathus longipinnis** (Regan).

12. **Acheilognathus lanceolata** (Schlegel).

Local name: Bote.

13. **Acheilognathus limbata** (Schlegel).

Local name: Zako; Bote; Aburazyako.

14. **Acheilognathus cyanostigma** Jordan & Fowler.

Local name: Aburazyako.

15. **Acheilognathus shimazui** Tanaka.  
Local name: Aburabote.
16. **Leucogobio jordani** Ishikawa.  
Local name: Yanagimoroko; Honmoroko.
17. **Leucogobio biwæ** (Jordan & Snyder).
18. **Leucogobio mayedæ** (Jordan & Snyder).  
Local name: Dememoroko; Moroko; Yanagimoroko.
19. **Leucogobio g ntheri** Ishikawa.  
Local name: Moroko; Yanagimoroko.
20. **Zezera hilgendorfi** (Ishikawa).  
Local name: Aburame.
21. **Sarcocheilichthys variegatus** (Schlegel).  
Local name: Higai; Aburabae.
22. **Abbottina psegma** Jordan & Fowler.
23. **Zacco platypus** (Schlegel).  
Local name: Haya; Oikawa.
24. **Zacco sieboldi** (Schlegel).  
Local name: Mutsu.
25. **Zacco temmincki** (Schlegel).  
Local name: Kawamutsu.
26. **Pseudogobio esocinus** (Schlegel).  
Local name: Kamatsuka.
27. **Otakia rasborina** Jordan & Snyder.
28. **Pseudorasbora parba** (Schlegel).  
Local name: Moroko; Yoshitsutsuki; Ch chinmoroko; Ishimoroko.

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29. **Ischikauia steenackeri** (Sauvage).  
Local name: Wataka; Wadaka; Watako; Umauwo.
30. **Leuciscus hakuensis** Günther.  
Local name: Ugui.
31. **Leuciscus jouyi** Jordan & Snyder.  
Local name: Aburamutsu; Aburamoroko.
32. **Leuciscus caerulescens** (Sauvage).
33. **Leuciscus japonicus** (Sauvage).
34. **Phoxinus steindachneri** Sauvage.  
Local name: Aburamutsu.
35. **Gnathopogon elongatus** (Schlegel).  
Local name: Moroko; Mugitsuki.
36. **Biwia Zezera** (Ishikawa).  
Local name: Zezera.
37. **Hemibarbus barbus** (Schlegel).  
Local name: Migoi; Sai.
38. **Opsariichthys uncirostris** (Schlegel).  
Local name: Hasu.
39. **Carassius auratus** (Linnæus).  
Local name: Zako; Gengorōbuna; Hiwara; Mabuna; Ganzo.
40. **Cyprinus carpio** Linnæus.  
Local name: Koi; Yamatogoi.
41. **Tribolodon punctatus** (Sauvage).

Anguillidæ.

42. **Anguilla japonica** Schlegel.  
Local name: Unagi.

Salmonidæ.

43. **Oncorhynchus masou** (Brevoort).

Local name: Amenouwo.

44. **Salmo perryi** Brevoort.

45. **Plecoglossus altivelis** Schlegel.

Local name: Hiuwo; Koayu.

Pœciliidæ.

46. **Oryzias latipes** (Schlegel).

Local name: Uroni; Medaka.

47. **Fundulichthys virescens** (Schlegel).

Local name: Kinta.

Cottidæ.

48. **Cottus pollux** Günther.

Local name: Fugu; Okoze; Kazika.

Gobiidæ.

49. **Ctenogobius similis** (Gill).

Local name: Ishimochi; Ishibishisho; Ishibushi.

50. **Chænogobius castaneus** (O'Shaughnessy).

Local name: Isaza.

51. **Chænogobius macrognathos** (Bleeker).

Local name: Haze; Ishibushi.

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52. **Odontobutis obscurus** (Schlegel).

Local name: Donko; Ishibushi; Doman; Dorobo; Chichinuko.

53. **Eleotris oxycephala** (Schlegel).

Local name: Doman.

54. **Acanthogobius flavimanus** (Schlegel).

55. **Chæturichthys hexanemus** (Bleeker).

Local name: Akahaze.

JUNE, 1908.

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